Regulation Development: Technology-Based Numerical Nitrogen and Phosphorus Limitations for Permits in the Chesapeake Bay Watershed

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Overall Purpose of Rulemaking:

- **Establish technology-based numerical discharge limits for total nitrogen, and possibly revise limits for total phosphorus.**

- **Assist in meeting the goals and commitments of the *Chesapeake 2000 Agreement* and implementing Virginia's Tributary Strategies.**

- **Aid in removing Virginia's portion of the Bay and its tidal tributaries from the Impaired Waters list.**

- **Applicable to Chesapeake Bay watershed VPDES permits, as part of Virginia's Bay Restoration Program.**

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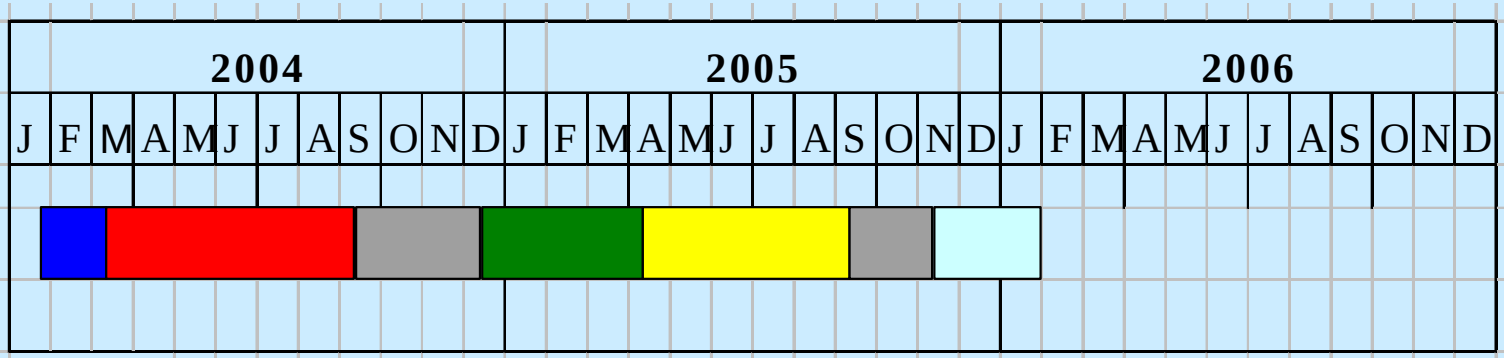
Schedule Timeline:



Legend

NOIRA	=	Notice of Intended Regulatory Action Comment Period (1/26-3/12/04), and Public Meeting (2/26/04)
Reg. Development	=	180 Days for Tech. Advisory Committee, Proposal Development, SWCB Approval for Public Comment, and Submission to Dept. of Planning & Budget
DPB	=	Dept. of Planning & Budget Economic Impact Assessment, and Executive Review
NOPC	=	Notice of Public Comment Period and Public Hearing(s)
Final	=	150 Days for Final Revisions, State Water Control Board Adoption and Submission to DPB
DPB	=	DPB and Executive Review
Final Effective	=	Final Publication, Atty. Gen'l Certification, and Effective Date Publication

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Chesapeake 2000 Agreement and Nutrient Reduction Commitments

- **C2K**: ***Improving water quality is the most critical element in the overall protection and restoration of Chesapeake Bay and its tributaries.***
    - **Goal for Nutrients**: ***Correct the nutrient-related problems in the Bay and its tributaries sufficiently to remove them from the list of impaired waters*.**
        - **Commitments**: ***Define the water quality necessary to protect living resources and assign load reductions for nitrogen and phosphorus to each major tributary.***

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On-going, Inter-related Actions:

- **Develop and adopt water quality standards protective of aquatic living resources.**
  - **NOIRA published 11/17/03; comment period ended 1/15/04**
  - **Ad-hoc Technical Advisory Committee formed**
  - **Scheduled for completion in early 2006**

- **Chesapeake Bay Program nutrient allocations for major basins, and revision of Tributary Strategies.**

- **This rulemaking: Technology-Based Numerical Nitrogen and Phosphorus Permit Limits**
  - **Directive from Governor Warner at 2003 Executive Council meeting**

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New/Revised Standards for Bay and Tidal Water Quality:

Proposed for three water quality parameters:

- **Dissolved Oxygen**
- **Water Clarity**
- **Chlorophyll**

Applicable to five designated uses:

- **Underwater Grass Habitat**
- **Fish Spawning/Nursery**
- **Open Water**
- **Deep Water**
- **Deep Channel**

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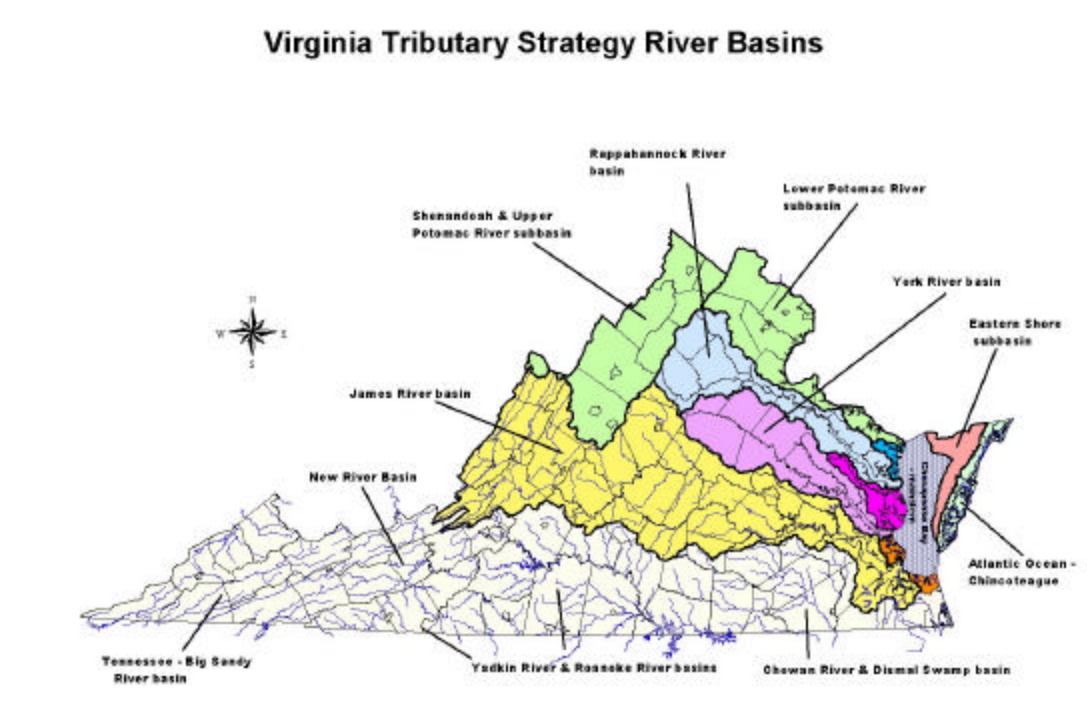
CBP Allocations and Tributary Strategy Revisions



Virginia's C2K Nutrient Load Allocations:

- **Nitrogen = 51.4 million lbs/yr**
- **Phosphorus = 6 million lbs/yr**

Estimated 2002 Progress Loadings:

- **Nitrogen = 77.8 million lbs/yr**
- **Phosphorus = 9.8 million lbs/yr**

- **Revised Strategies scheduled for completion 4/30/04**

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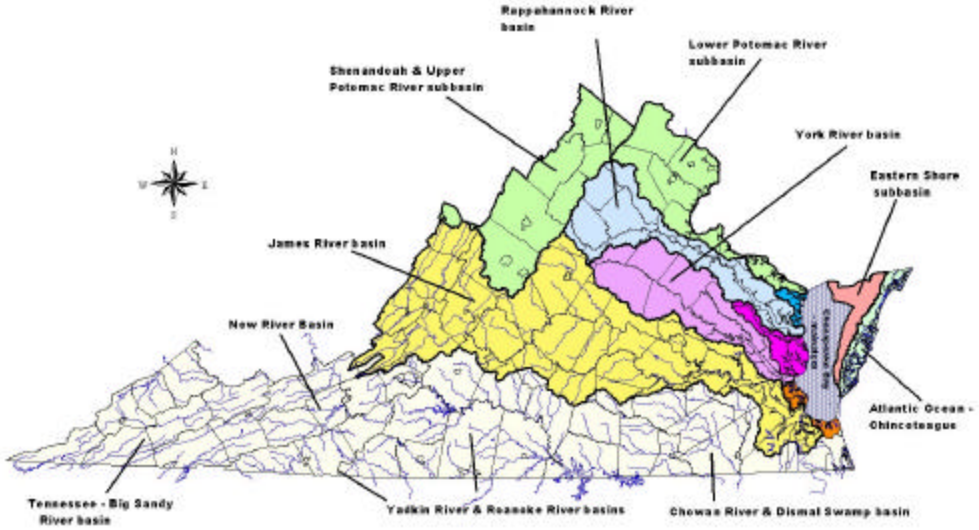
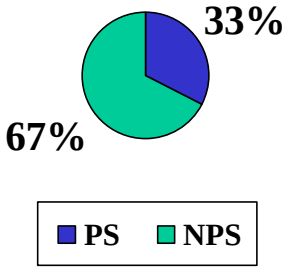
VA's Bay Watershed N&P Loads

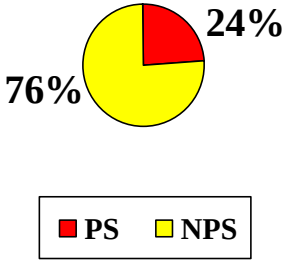


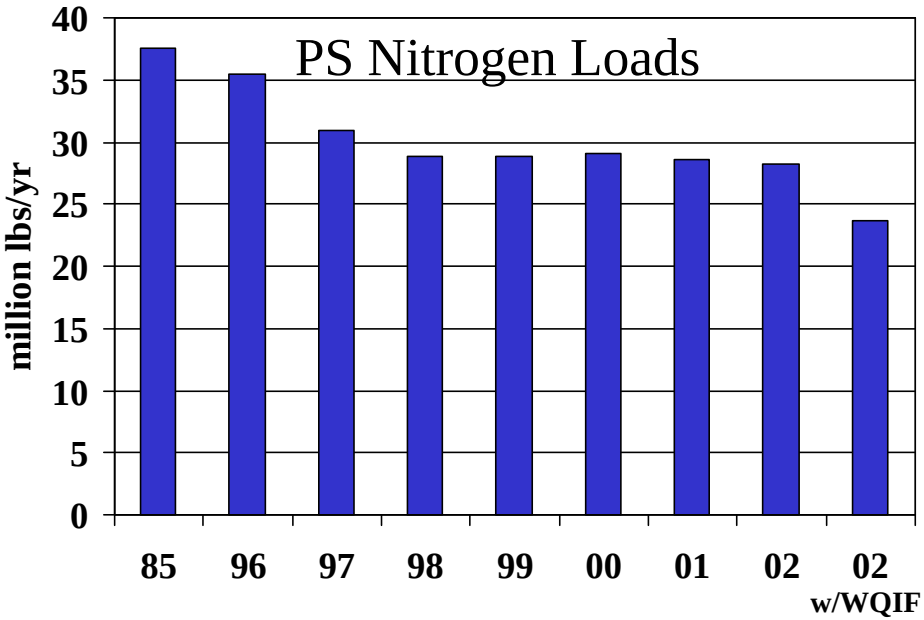
YR 2002

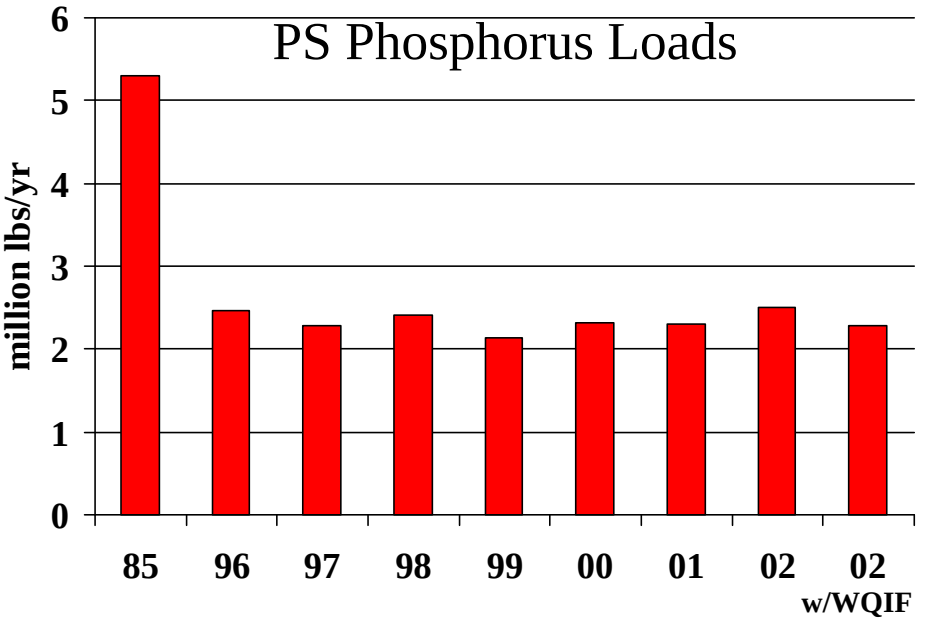
Nitrogen Load



Phosphorus Load







PS facilities tracked: 82 municipal; 17 industrial; 23 WQIF projects

This Point Source Nutrient Regulation:

- **Primary action - proposal is to amend the *Point Source Policy for Nutrient Enriched Waters* (9 VAC 25-40).**
  - **Affects certain discharges to Nutrient Enriched Waters**
  - **Only controls phosphorus at this time**
- **Secondary Action - considering amendments to the *Water Quality Management Regulation* (9 VAC 25-720).**
  - **May be needed to formally express basin allocations for point sources**

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Comparison of Chesapeake Bay Voluntary and Regulatory Processes

Voluntary

- C2K Agreement established framework for delisting the Bay
- CBP has proposed uses and criteria that define a restored Bay
- Pollutant allocations established using Bay models to achieve criteria
- Tributary Strategies will identify management actions to meet allocations

Regulatory

- Water Quality Standards define a restored Bay in regulation and establish endpoints to determine pollution reductions
- Point Source Regulation defines minimum level of treatment
- WQMP regulation, based on Tributary Strategies, identifies loading allocation caps

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Basis for VPDES Permit Limits

Combination of these three regulations:

1. **Point source regulation establishes numerical effluent limits for nutrients**
2. **Water Quality Management Planning regulation establishes nutrient waste load allocations for nutrients by basin [or discharger]**
3. **Water Quality Standards regulation establishes uses and criteria that form the basis for needed nutrient reductions**

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Status of Existing Point Source Nutrient Control

Combination of regulatory and voluntary measures:

- **Potomac Embayment Standards**
- **Occoquan/Dulles Area Watershed Policies**
- **Point Source Policy for Nutrient Enriched Waters**
- **WQIF Point Source Grant Program**
- **Industrial Pollution Prevention Activities**

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Status of Existing Point Source Nutrient Control

Potomac Embayment Standards:

- **Controls point source discharges into VA's Potomac embayment waters from Chain Bridge in Arlington Co. to Route 301 Bridge in King George Co.**
- **Monthly average phosphorus limit = 0.18 mg/l**
- **Adopted in response to severe nutrient enrichment impacts (algae blooms) in local receiving waters**

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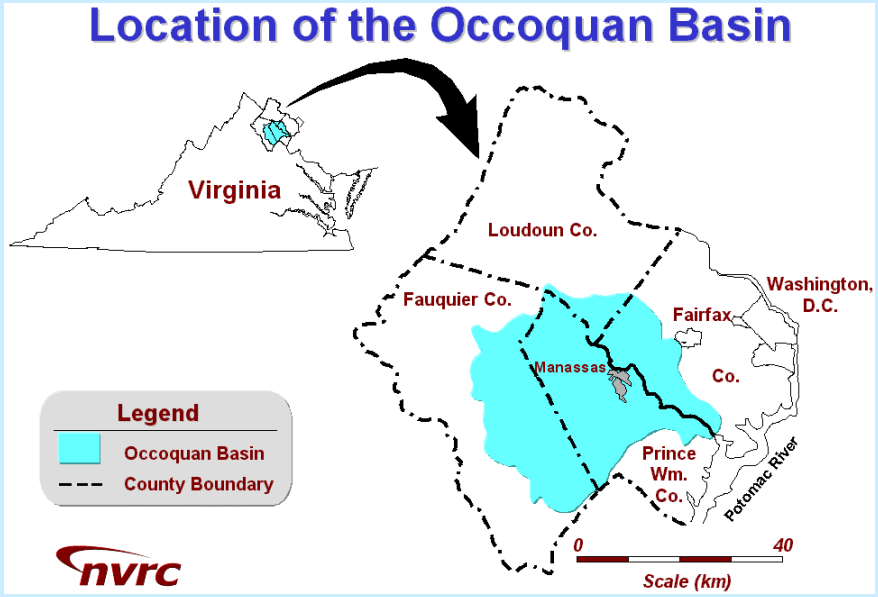
Status of Existing Point Source Nutrient Control

Occoquan/Dulles Area WS Policy:

- **Part of a comprehensive management program for this 590 sq. mi. watershed**
- **Along with the Potomac, provides drinking water to nearly 1.2 million people**
- **Requires extremely high quality wastewater treatment, with monthly average phosphorus limit = 0.10 mg/l (the 'limit-of-technology')**



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Status of Existing Point Source Nutrient Control

PS Policy for Nutrient Enriched Waters:

- **Applies to "nutrient enriched" waters (identified in WQ Stds.); generally the Bay and tidal portions of it's tributaries, and some fresh water areas**
- **Affects VPDES permits with design capacity of 1 MGD or more; and new discharges of 50,000 gpd or greater**
- **Monthly average phosphorus limit = 2.0 mg/l**

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WQIF Point Source Grant Program

- Created by 1997 Water Quality Improvement Act
- Special, permanent, non-reverting Fund
- Purpose: provide 50% grants for point source pollution prevention, reduction and control projects
- Initial focus on nutrient reduction as part of Tributary Strategy

WQIF Appropriations Point Source Program	
FY 1998	$10.00 million
FY 1999	$37.10 million
FY 2000	$25.24 million
FY 2001	$10.30 million
Interest earned (thru '04 YTD)	$ 10.15 million
TOTAL:	$92.79 million

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WQIF Point Source Grant Program

Project	*Grant*
ACSA-Stuarts Draft	$1,382,783
Alexandria	$20,147,914
Arlington	$10,816,973
Ch. Co.- Proctors Crk	$965,560
Dale Serv. Co. #1	$1,901,057
Dale Serv. Co. #8	$2,115,053
Fairfax - Blue Plains	$1,387,500
Fairfax - Noman Cole	$10,399,500
Fauquier - Remington	$886,138
FWSA - Opequon	$2,754,618
Hanover - Totopotomoy	$2,109,770
HRRSA - N. River	$2,850,937
Henrico	$8,906,687
Hopewell	$2,418,647
Leesburg	$6,477,734
LCSA - Blue Plains	$365,500

Project	*Grant*
PWCSA - Mooney	$9,094,338
Purcellville	$1,604,413
SIL - Clean Water	$2,529,890
Spotsylvania - FMC	$1,767,000
Spots. - Massaponax	$4,294,553
Stafford - Aquia	$351,962
Stafford - L. Falls Run	$1,962,833
Staunton - Middle River	$1,236,660

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WQIF Point Source Grant Program

Nitrogen Discharge at Completed Projects: (requirement for 8 mg/l annual average)

Project	***2003 Avg Nitrogen***
ACSA - Stuarts Draft	4.52
Ch. Co. - Proctors Crk	6.58
Dale Serv. Co. #1	3.63
Dale Serv. Co. #8	4.65
FWSA - Opequon	5.72
HRRSA - N. River	6.86
Leesburg	5.90
PWCSA - Mooney	7.53
Stafford - L. Falls Run	4.61
Stafford - Aquia	7.41
Staunton - Middle River	5.70

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Industrial Nutrient Pollution Prevention

- **A number of industrial plants have reduced nutrient loads through *"P2"* initiatives**
- **Usually involves raw materials substitution, side stream treatment, or operational changes in wastewater process**

Examples of Industrial "P2" Nutrient Reductions	
Honeywell - Hopewell	TN load down 70% since 1985
BWX-Technologies	TN load down 76% since 1985
Merck	TN load down 64% since 1985
DuPont-Waynesboro	TN load down 84%, TP load down 98%, since 1985
Smurfitt-Stone	TN load down 66%, TP load down 82%, since 1985
Tyson -Glen Allen	TN load down 75% since 1985

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NOIRA "Town Hall" Document

- ***Purpose:***
  - **Establish numerical total nitrogen discharge limits, and possibly revise total phosphorus limits, for certain permitted discharges in Bay watershed, based on state-of-the-art-technology.**
  - **Protect State Waters by adopting a regulation that is technically correct, necessary, and reasonable.**

The Virginia Regulatory Town Hall

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NOIRA "Town Hall" Document

- ***Substance:***
  - **Proposed regulatory action will amend existing provisions on point source nutrient discharges.**
  - **Water quality in the Bay is significantly impacted by nutrients from point sources (municipal and industrial) and nonpoint sources.**
  - **A range of technologies are available, and the State Water Control Board will consider all options.**

The Virginia Regulatory Town Hall

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NOIRA Alternatives

1 **Whether implementation at municipal plants should be contingent on availability of construction grants.**

2 **Whether technology-based TN limit in permit should be 3 mg/l (limit-of-technology), 5 mg/l (enhanced nutrient removal), 8 mg/l (biological nutrient removal), or some other level.**

3 **Whether phosphorus effluent limit remains as currently defined in PS Policy, or should another technology-based limit be adopted.**

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NOIRA Alternatives (cont.)

4 **Whether assignment of TN and TP limits can be done in ways to ensure that wastewater plants are able to serve future service needs, and also protect the Bay.**

5 **Whether limits should apply to certain discharges throughout all, or only certain sections of the river basins in the Bay watershed.**

6 **Whether limits should apply to:**

- **all permitted discharges**
- **those defined in the PS Policy for Nutrient Enriched Waters**
- **“significant” discharges as identified by the Bay Program and included in Tributary Strategies**
- **discharges defined in some other manner**

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NOIRA Alternatives (cont.)

7 **Whether the monthly averaging period in the PS Policy should be applied to these technology-based limits, or use some other averaging period (e.g., annual average, seasonal tiers).**

8 **Whether the Policy should also have requirements for nutrient <u>loadings</u>, or should loadings be governed by:**

- **the applicable Tributary Strategy**
- **a Total Maximum Daily Load allocation**
- **some other action by the State Water Control Board**

9 **Whether the Policy should include a process for granting a variance, due to plant constraints or wastewater type.**

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NOIRA Alternatives (cont.)

10 **Whether the revised Policy should include implementation schedules.**

11 **Whether the revised Policy should contain provisions for integration with watershed approaches, such as:**

- **watershed permitting (e.g., “bubble concept”)**
- **point source-to-point source trading**

12 **Whether the individual alternatives listed above should be included in agency guidance or within the Policy itself.**

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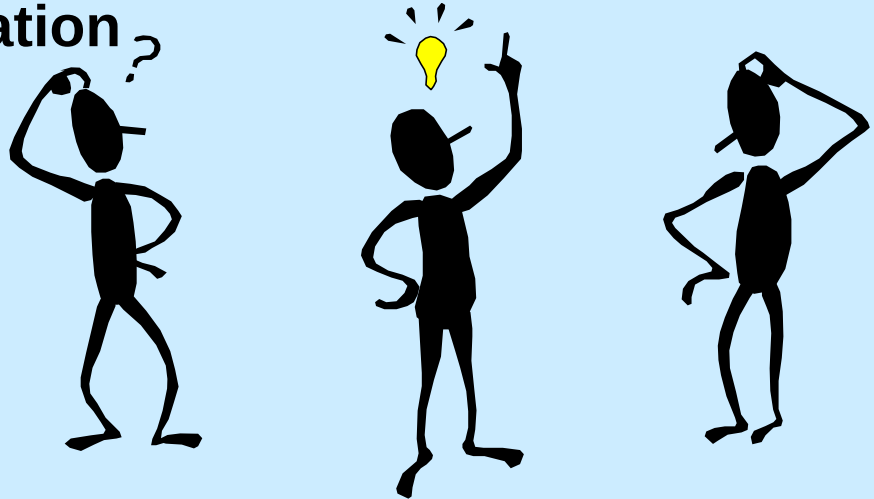
Public Participation for Regulation Development

- ***Seeking comments especially on:***
  - **the intended regulatory action**
  - **ideas to assist in development of a proposal**
  - **on the alternatives listed previously**
  - **the costs and benefits of the listed alternatives and any others**
  - **impacts of the regulation on farm and forest land preservation**



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Technical Documents Supporting Regulation Development

- ***"Economic Analyses of Nutrient and Sediment Reduction Actions to Restore Chesapeake Bay Water Quality"*, May 2003 (incl. Appendices A - D)**
  http://www.chesapeakebay.net/ecoanalyses.htm

- ***"Nutrient Reduction Technology Cost Estimations for Point Sources in the Chesapeake Bay Watershed"*, Nov. 2002**

  http://www.chesapeakebay.net/pubs/NRT_REPORT_FINAL.pdf

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Participatory Approach

- A Technical Advisory Committee will be formed to assist in Regulation development
- Anyone interested in serving on the TAC should contact DEQ staff
- DEQ Director will decide TAC membership after close of NOIRA public comment period

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Remaining Actions

- **Closing date for NOIRA public comments is March 12, 2004**
- **General Schedule for TAC meetings: monthly, from mid-March to mid-August**
- **Plan to submit proposal to State Water Control Board in September**

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Contact Information

- **DEQ Staff Contact Information:**
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  - **John Kennedy: 804-698-4312 jmkennedy@deq.state.va.us**

- **Internet website address for information during rulemaking:**

  http://www.deq.state.va.us/bay/multi.html

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